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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/722,122	11/26/2003	Shigeru Sakamoto	50002-018	4842

7590

03/28/2006

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Washington, DC 20005-3096

EXAMINER

CHUO, TONY SHENG HSIANG

ART UNIT	PAPER NUMBER
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1746

DATE MAILED: 03/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/722,122

Applicant(s)

SAKAMOTO ET AL.

Examiner

Tony Chuo

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☒ Claim(s) 2 and 6 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 November 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 4/23/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Drawings

1. Figures 6-8 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

2. The abstract of the disclosure is objected to because on line 1, the phrase "surface on an" should be changed to "surface of an". Correction is required. See MPEP § 608.01(b).
3. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.
4. The disclosure is objected to because of the following informalities: There are numerous letter "e's" missing from the specification such as on page 3, line 1, page 4, line 1, page 5, line 1. The entire specification should be checked for these misprints. Appropriate correction is required.

Claim Objections

5. Claims 2 and 6 are objected to because of the following informalities: there are several missing letter "e". Appropriate correction is required.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1-5 and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Zuber et al (US 2002/0051901). Regarding claims 1 and 7, the Zuber reference teaches a fuel cell integrated by laminating one or more single cells in the form of a single unit comprising an electrolyte membrane "5", a fuel electrode catalyst layer "6", an air electrode catalyst layer "7", a first gas diffusion layer "8", a second gas diffusion layer "9", a first separator "3" having more than one concave portions and convex portions forming more than one gas flow channels for reactant gas, a second separator "4" having more than one concave portions and convex portions forming more than one gas flow channels for reactant gas, wherein the fuel cell is formed by clamping the layer elements between the first and second separators to fasten the layer elements together and the fuel cell is equipped with a means for restraining the reactant gas flowing into adjacent gas flow channels via the first or second gas diffusion layer in order to prevent the generation of water droplets in gas flow channels by compressing the gas diffusion

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layers to 25 to 60% of their original thickness (See Figure 1 and paragraph [0014]).

Regarding claim 2, it is inherent that when the seal between the convex part of the separator and the gas diffusion layer is improved, the pressure loss between adjacent flow channels is greater than the pressure loss of the reactant gas blowing away the water in the gas flow channels. Regarding claim 3, it teaches a gas diffusion layer comprising a carbon fiber fabric such as AvCarb 1071 that is commercially available (See paragraph [0021]). It is well known in the art that the gas permeability of the carbon fiber fabric in the direction perpendicular to the gas flow direction and parallel to the surface of the separator is smaller than the gas permeability in the gas flow direction and in the lamination direction of the single cells. Regarding claims 4 and 5, it teaches a gas diffusion layer comprising a carbon fiber fabric that included fibers positioned parallel to the direction of the gas distribution channels (See paragraph [0050]). It also teaches more than 50% of all the gas flow channels arranged approximately parallel to the fiber direction of the fibrous elements in the gas diffusion layer (See Figure 2).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zuber et al (US 2002/0051901) in view of Ouvry et al (US 6444347). The Zuber reference is

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applied to claims 1-5 and 7 for reasons stated above. However, it does not expressly teach a gas diffusion layer where 70% or more of the fibers are arranged parallel to the gas flow direction in the separator. The Ouvry reference teaches a gas diffusion electrode that has unidirectional fibers so that more than 70% of the fibers are arranged in the same direction. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Zuber fuel cell to include a gas diffusion layer that has unidirectional fibers such that the fibers are arranged parallel to the gas flow direction in the separator so that a higher strength material can be used as the gas diffusion layer.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tony Chuo whose telephone number is (571) 272-0717. The examiner can normally be reached on M-F, 8:30AM to 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr can be reached on (571) 272-1414. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should

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you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

u 3/22/06

A handwritten signature in black ink, appearing to read "Michael Barr", with a stylized flourish extending from the end.

**MICHAEL BARR
SUPERVISORY PATENT EXAMINER**